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hibition against having possession or control of the drugs named in the act by persons not registered applies only to persons who import, manufacture, give away, or deal in the drugs.

The prosecutions which have been brought under section 8 of the law show its importance if given a broad construction and general application, but grave constitutional questions are involved.

Two of the decisions referred to are printed in this issue of the Public Health Reports, pages 141 and 143.

PYORRHEA ALVEOLARIS.

PRELIMINARY REPORT ON TREATMENT WITH IPECAC AND EMETIN HYDROCHLORIDE.¹

By JOHN S. RUOFF, Assistant Surgeon, United States Public Health Service, Fort Stanton Sanatorium for Tuberculosis.

The investigation of the curative effects of ipecac and emetin in pyorrhea alveolaris was instituted by direction of the Surgeon General, United States Public Health Service, the conditions at this station (Fort Stanton) being especially suitable for the work. The patients are under the immediate surveillance of the officer in charge and are at all times accessible for the administration of treatment. Every encouragement was offered for a thorough trial. The cooperation of the patient was further enlisted by pointing out the possible effects of pyorrhea alveolaris on tuberculosis and the good that might result from the cure of existing pyorrhea. The work has been under way for nine months. It is still being pursued.

Class of Cases.

In setting forth the results obtained in the treatment of pyorrhea alveolaris at the Fort Stanton Sanatorium, a few words as to the class and character of patients treated will not be out of place.

The patients at this sanatorium consist of the beneficiaries of the United States Public Health Service, made up in this instance chiefly of seamen and officers of merchant vessels. A large percentage of these men have never taken proper care of their teeth; thus out of 78 cases treated 51 had always neglected their teeth. The care bestowed by the remainder is doubtful. Pyorrhea, as stated by the leading workers with the disease to-day, is practically universal and one would naturally expect to find a large percentage of far-advanced cases among this class of men. Of the 78 treated, 34 (43.6 per cent) were far-advanced cases of pyorrhea. All of these patients have tuberculosis in some stage, but mostly far advanced.

¹ Submitted for publication Nov. 29, 1915.

Untoward Effects.

Knowing that the tuberculous patient is subject to disturbances of the alimentary tract, and knowing too that emetin tends to cause nausea, vomiting, and diarrhea, it will be correctly surmised that the investigators have had more than their share of these symptoms to contend with. Also, they have had to content themselves with the minimum number of injections in each case for fear of upsetting the stomach and causing the patient to become dissatisfied and discontinue the treatment altogether. In a large number of cases they have had to use emetin hypodermatically until the endameba were no longer demonstrable, and then to depend upon the local use of a mouth wash of fluid extract of ipecac in an effort to maintain the condition.

Knowing the tendency of the tuberculous subject to become hypochondriacal, neurasthenic, nervous, his tendency to complain of the least discomfort, and knowing, too, the discomfort and pain, at times extreme, caused by the local reaction of emetin given hypodermatically, one will surmise, and correctly, that the investigators have had to contend with many complaints of painful arms and have had to discontinue the hypodermatic treatment for that reason in many of their cases. It may also be added here that the number of cases treated would have been much larger had it not been for the local discomfort and other deleterious effects caused by emetin, these effects causing the treatment to be contraindicated in some and refused by a large number of subjects in whom it was indicated.

Prevalence and Character of Infection.

Recent writers state that about 98 per cent of all persons will show the endameba-buccalis. Of 190 examined here, 187 showed the endameba. Our cases were chosen at random among the patients. Practically all of them seemed to have a pyorrhoeal tendency, although of the 78 treated, 14 had no clinical symptoms of pyorrhea, while the remainder, 64, had one or more of the clinical symptoms: viz, pockets, pus, loose teeth, receding gums, and bleeding gums. Of these, the last named symptom was the most frequently found, occurring in 51 of the 64 cases. It may be stated that this symptom of bleeding gums was the one most frequently affected by the emetin and ipecac, and always the first to disappear.

Details of Treatment.

The investigators followed in a general way the plan of treatment set forth by Bass and Johns in their book *Pyorrhea Alveolo-Dentalis*. Each patient was given an initial examination, his history being taken at the same time to determine as nearly as possible the date

of onset, amount of care taken of the teeth, the use of tobacco, the condition of the digestive apparatus, and the presence or absence of bleeding gums. He was then sent to the dentist and a careful examination of the mouth made to determine the condition of the teeth and gums. The teeth were then scaled, old roots and hopeless teeth were extracted, and the mouth was put in as good condition as possible, some of the actual operative work being done by the writer. No other operative procedures were attempted, and no routine treatment of the teeth and gums was carried out other than by the brush in the hands of the patient. He was next sent to the laboratory where a microscopical examination was made for endameba.

For the convenience of study, and ease in tabulating and comparing results, the cases were divided into classes, as shown below.

At the time of scaling by the dentist each patient was given a supply of fluid extract of ipecac to use locally. The first two classes to be treated were directed to use two or three drops on the brush. The investigators also used a tooth powder modified by mixing with the stock 5 grams of powdered ipecac to 95 grams of the powder, but this was later discontinued and all were directed to use 10 drops of fluid extract of ipecac in one-fourth to one-half glass of water as a mouth wash after cleaning the teeth morning and night

CLASS 1.

This consisted of 20 men, of whom 2 (squad A) had apparently healthy mouths; 7 (squad B) had receding or bleeding gums or both; while 11 had gross lesions of pyorrhea. All received three $\frac{1}{2}$ -grain (0.03 gram) doses of emetin on consecutive days and were examined for endamebæ on the fourth day, and all found positive. This treatment was repeated on the three following days, and upon reexamination 11 were found negative, 7 were still positive, and 2 were discontinued on account of nausea, vomiting, and loss of appetite. These 7 were then given three $\frac{3}{4}$ -grain (0.045 gram) doses of emetin on consecutive days, and upon reexamination 6 were negative and 1 still showed endamebæ. This one case was given three more $\frac{3}{4}$ -grain (0.045 gram) doses of emetin on the next three days and was finally negative after the twelfth dose, having received six doses of one-half grain (0.03 gram) each and six doses of three-fourths grain (0.045 gram) each, covering a period of 12 days.

Subsequent history of class 1.—All continued to use the fluid extract of ipecac locally, but in spite of this every member of class 1 showed the endamebæ upon reexamination four weeks later. The physical condition of the gums and teeth in squad A was unchanged; 4 of squad B remained the same, 2 were moderately improved, and the

results were doubtful in 1; of squad C, 8 remained the same, 1 was slightly improved, and 2 were greatly improved.

At the time of writing, three and one-half months later, the condition of these mouths has not changed.

CLASS 2.

This consisted of 12 men, of whom 4 (squad A) had healthy mouths; 8 (squad B) had receding or bleeding gums, or both; there were no far advanced cases of pyorrhea in this class. All received three $\frac{1}{2}$ -grain (0.03 gram) doses of emetin on consecutive days and were examined on the fourth day. Of the 12 men, 6 were negative after three doses of one-half grain (0.03 gram) each; 1 discontinued treatment on account of rise of temperature; the remaining 5 received three more $\frac{1}{2}$ -grain (0.03 gram) doses on the next three days; and all were found negative after the sixth dose.

Subsequent history of class 2.—All continued the use of fluid extract of ipecac locally, but all showed the endamebæ three weeks later. The physical condition of the gums and teeth in squad A and 5 of squad B remained the same, while 3 of the latter were slightly improved.

At the time of writing, three months later, the physical condition of these mouths is unchanged.

CLASS 3.

This class consisted of 13 men, of whom 1 had a healthy mouth, 8 (squad B) had receding or bleeding gums or both, and 4 had gross lesions of pyorrhea. None were negative after three doses of one-half grain (0.03 gram) each, but 6 were negative after six doses of one-half grain (0.03 gram) each; the remaining 6 were still positive, but were discontinued on account of various disagreeable symptoms.

Subsequent history of class 3.—All continued the local use of fluid extract of ipecac, but 11 of the 12 men showed the endamebæ two weeks later. The physical condition of the gums and teeth in the 1 healthy mouth remained unchanged, 4 of squad B were slightly improved, and 3 were moderately improved. In squad C, 2 were slightly improved, while 2 remained the same.

At the time of writing, nearly three months later, the physical condition of these mouths is unchanged.

CLASS 4.

This class consisted of 5 men, all with unusually good teeth, but with incipient pyorrhea. No emetin was given hypodermatically. These men were all given a mouth wash of diluted hydrogen peroxide and fluid extract of ipecac. After brushing the teeth the mouth was

rinsed with hydrogen peroxide, then with fluid extract of ipecac, 10 drops in one-fourth glass of water. This was kept up twice daily for two months, at the end of which time they all still showed the endameba and no improvement in the physical appearance of the gums and teeth.

Our experience is thus at variance with the results recorded by Bass and Johns in work with a similar class of cases.

CLASS 5.

This consisted of 12 men, of whom 1 (squad A) had a healthy mouth, 6 (squad B) had either receding or bleeding gums or both, and 5 showed gross pyorrheal lesions. Four were negative after three doses of one-half grain (0.03 gram) each, 1 discontinued treatment on account of rise of temperature. Seven men received six doses of one-half grain (0.03 gram) each, but only 2 were rendered negative; the remaining 5 discontinued treatment on account of various disagreeable symptoms.

Subsequent history of class 5.—Eleven of the 12 men showed the endameba four weeks later in spite of using fluid extract of ipecac as a mouth wash. The physical condition of the gums and teeth in the one healthy mouth remained the same, 2 of squad B remained unchanged, and 4 were slightly improved. In squad C, 1 was slightly improved and 4 were moderately improved.

At the time of writing, two and one-half months later, the condition of all these mouths is the same.

CLASS 6.

This class consisted of 16 men, of whom 1 (squad A) had a healthy mouth, 5 (squad B) had receding or bleeding gums or both, and 10 (squad C) had gross lesions of pyorrhea. All received six $\frac{1}{2}$ -grain (0.03 gram) doses of emetin on consecutive days before being reexamined. Twelve were negative after the sixth dose, 1 discontinued treatment on account of local reaction, 3 were still positive but were discontinued on account of the exhaustion of our supply of emetin.

Special technique in observations on local reaction.—This class was subdivided into four smaller groups of four men each. Group A received hypodermatic injections of emetin dissolved in 2 c.c. of water injected into the arm. Group B received emetin dissolved in 4 c.c. of water injected into the arm. Group C received emetin dissolved in 2 c.c. of water injected into the buttocks. Group D received emetin dissolved in 2 c.c. of normal saline solution injected into the arm. No marked difference in the amount of local reaction was noticed.

Subsequent history of class 6.—Of the 12 men that were negative after the sixth dose of emetin, 10 were reexamined four months later and all found positive, although all used fluid extract of ipecac as a mouth wash twice daily. The physical condition of the gums and teeth in the 1 healthy mouth and in 2 of squad B and in 4 of squad C remained the same. Two of squad B and 5 of squad C were slightly improved. The results were doubtful in 1 man in squad B, while 1 of squad C became worse.

At the time of writing, two months later, the physical condition of the gums and teeth remains unchanged.

Status of Pyorrhea Treatment in the Literature.

Ernest Sturridge, D. D. S., London,¹ prefers the treatment of pyorrhea by ionization with zinc ions, and says "after treatment by ionization alone with zinc chloride," he found in every instance that amebæ were not present upon reexamination. He recommends in addition careful cleansing and instrumentation and the application of a weak solution of iodine in bad cases, as advocated by Dr. Barrett.

Barton Lisle Wright and Paul Gardiner White, United States Navy,² give deep muscular injections of mercuric succinamid and claim good results.

F. E. Stewart, M. D., Phar. D., Philadelphia,³ recommends thorough removal of all tartar and dead and infected pulps, the filling of root canals, the use of fluid extract of ipecac or emetin as a local application to the gums and teeth in tooth washes, the employment of emetin to destroy endamebæ, and the injection of bacterin, either a stock bacterin or an autogenous vaccine.

Arthur H. Merritt, D. D. S., New York,⁴ places no confidence in either emetin or vaccines when he says that "no drug or vaccine ever will of itself cure the disease." He believes pyorrhea to be a preventable disease, and a curable disease if not too long neglected. His treatment consists in a "careful curettage of each pyorrheal pocket, the removal of calcareous deposits and necrotic tissue, the correction of occlusion on weakened teeth, the stimulation and massage of the gums, and the maintenance of a high standard of mouth hygiene."

T. Sidney Smith, Palo Alto, Cal.,⁵ has confidence in proper surgical treatment of pyorrhea, and says "Periodontal diseases are not cured until the pyorrheal pockets have been entirely obliterated," and "that such healing does not depend on either the absence or presence of endamebas, but entirely on the character of the tissues and the thoroughness of the surgery."

¹ Ernest Sturridge, D. D. S., Dental Cosmos, July, 1915.

² Barton Lisle Wright, M. D., and Paul Gardiner White, M. D., Dental Cosmos, July, 1915.

³ F. E. Stewart, M. D., Phar. D., New York Medical Journal, Aug. 7, 1915.

⁴ Arthur H. Merritt, D. D. S., New York Medical Journal, Aug. 7, 1915.

⁵ T. Sidney Smith, D. D. S., Journal A. M. A., May 8, 1915.

Summary of Results.

Of 190 cases examined 187 showed endameba. Of the 187, 78 have been treated for pyorrhea. Of the 78 treated, none lost their endamebæ permanently. The condition of the gums and teeth was greatly improved in 3 cases, moderately improved in 9 cases, slightly improved in 22 cases, while 41 cases remained the same; the results were doubtful in 2 cases and 1 case became worse. Practically all that were found negative for endamebæ at the conclusion of the injections were found positive for endamebæ from two weeks to four months later, in spite of using a solution of ipecac as a mouth wash.

Conclusion.

Emetin is an amebicide, but alone will not cure pyorrhea alveolaris.

Outline of Future Work.

Less confidence will hereafter be placed in the properties of emetin or other preparations of ipecac, although it is not denied that the drug possesses amebicidal properties. It appears necessary to revert to a degree at least to those painstaking and tedious operative procedures, the efficacy of which has long been known to dental surgeons. Just how much assistance is to be expected from the ipecac preparations used in conjunction with operative measures is a question upon which further studies may be expected to throw some light.

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NARCOTIC DRUGS.

RECENT LEGISLATION DESIGNED TO RESTRICT THEIR USE.¹

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While the practicability of effectually controlling the use of narcotic drugs by statute law may reasonably be questioned, it is generally agreed that recent legislation is designed to and will, if properly enforced, effectually place the blame for the continuance of the narcotic-drug abuse where it rightfully belongs. It would also appear possible that, having learned the origin and cause of the

¹ Read at the meeting of the American Society for the Study of Alcohol and Other Narcotics, Washington, D. C., Dec. 16, 1915.